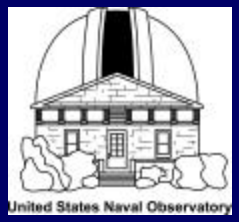


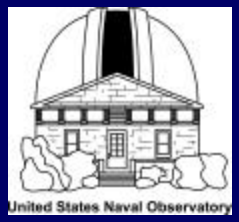
The Hipparcos Catalog

Sean E. Urban

U.S. Naval Observatory

Hipparcos: The Basics

- Satellite operation: 1989.8 to 1993.2
- Epoch of catalog: 1991.25 (ICRS)
- Represents the ICRF in the optical
- 117,955 w/ astrometry
  - Complete to V=7.3 – 9.0
  - Pos. err. 1-3 mas; P.M. err. 1-5 mas/yr
  - Parallaxes included



Hipparcos: The Basics, cont.

- 118,204 w/ photometry
  - Broad band visual
  - Errors V = 0.002 mag.
- B and V from Tycho detector
  - Errors B and V = 0.02 mag.
- Variability information
- Extensively documented

Distribution of Stars on the Sky

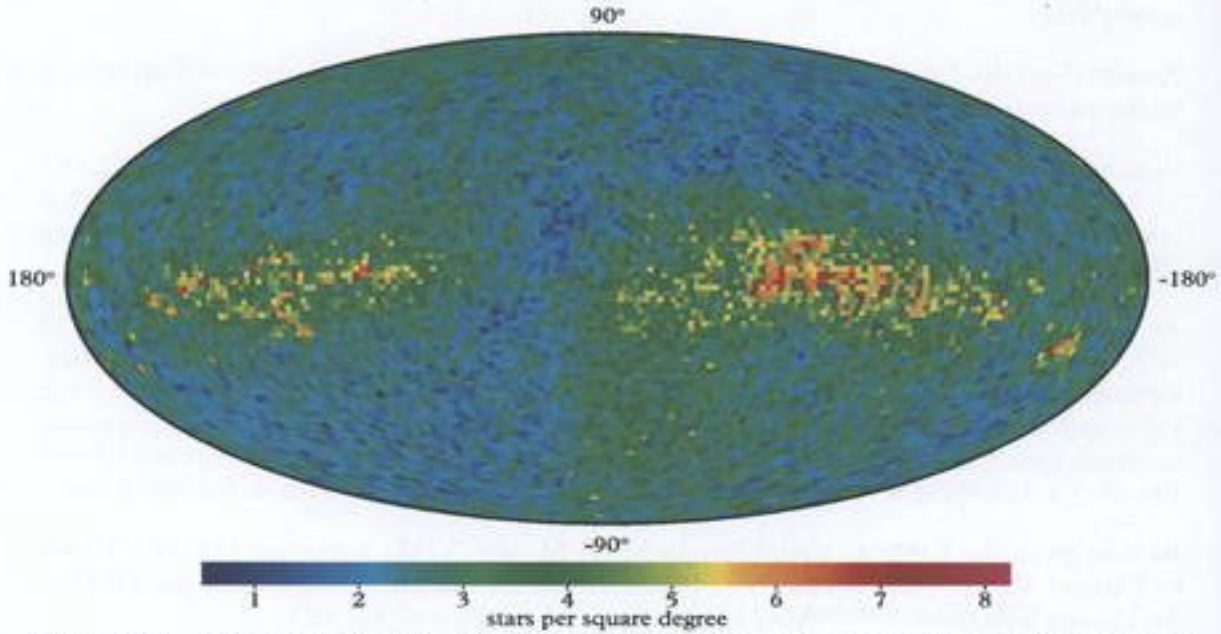
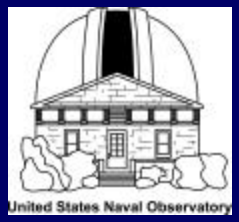


Figure 3.2.1. *Hipparcos Catalogue: number of observed stars per square degree, in galactic coordinates (cell size 2° × 2°). On the average there are 2.8 stars per square degree in the Hipparcos Catalogue.*



Not All Created Equally

- Flags identify potential problem cases
  - C, G, V, O, and X stars
  - Errors likely underestimate
  - Can have severe problems
- 18,000 “problem” stars
- Can utilize ground-based observations to identify and mitigate problems

United States Naval Observatory

Positional Errors

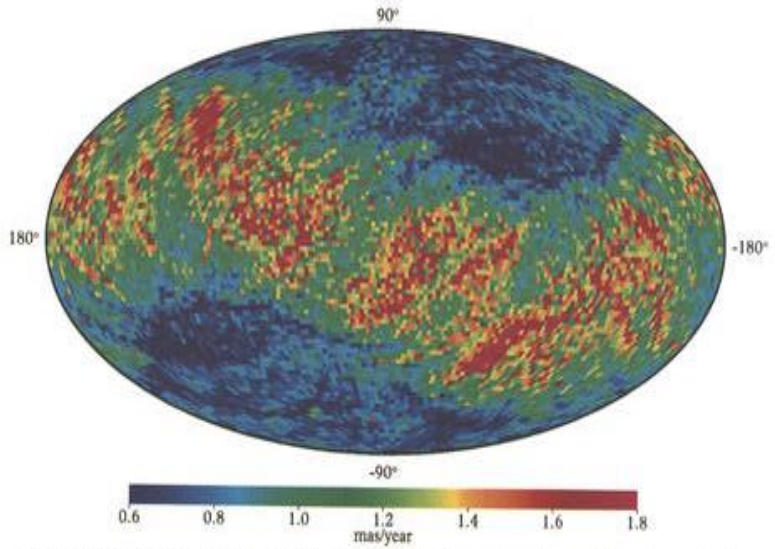


Figure 3.2.29. Hipparcos Catalogue, Field H17: median standard error of $\mu_{\alpha*}$, in equatorial coordinates (cell size $2^\circ \times 2^\circ$).

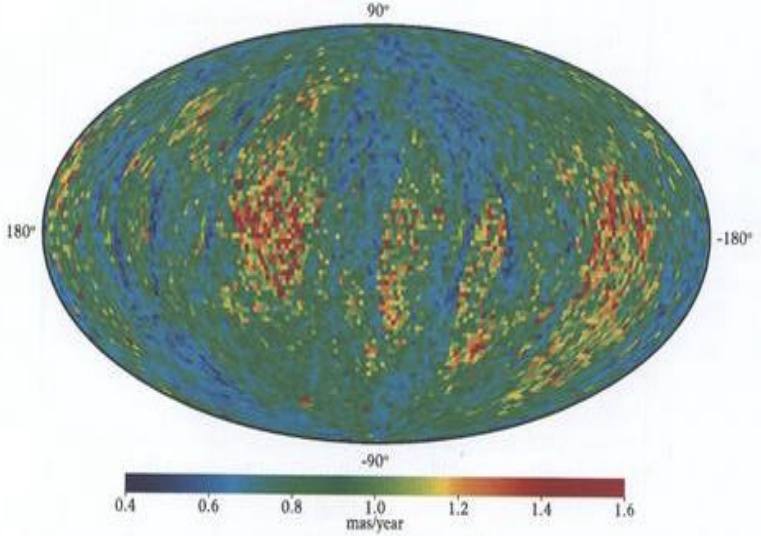
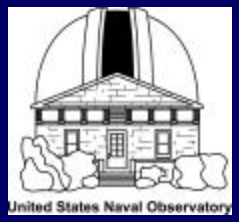


Figure 3.2.33. Hipparcos Catalogue, Field H18: median standard error of μ_δ, in equatorial coordinates (cell size $2^\circ \times 2^\circ$).



Summary

- Hipparcos is the standard in the optical
- Use where possible
- Understand caveats, especially with flagged stars
- USNO can aid in evaluation of data